



# HX-SERIES FACTS, FEATURES & BENEFITS

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## HX Series Speaker Systems

### Home Theater Reference Speaker Systems

For the flawlessly accurate, exquisitely clear reproduction of movie soundtracks in your own personal theater.

#### **NS-8HX**

3-Way Bass-Reflex  
Speaker System

#### **NS-6HX**

3-Way Bass-Reflex  
Speaker System

#### **NS-4HX**

2-Way Bass-  
Reflex Speaker  
System

#### **NS-2HX**

2-Way Bass-Reflex Speaker System

#### **NS-C7HX**

2-Way Acoustic Suspension Speaker System

#### **NS-C5HX**

2-Way Acoustic Suspension Speaker System



# FACTS, FEATURES & BENEFITS

## **HX Series: Home Theater Reference Speaker Systems**

### For Home theater Enjoyment in the Digital Age.

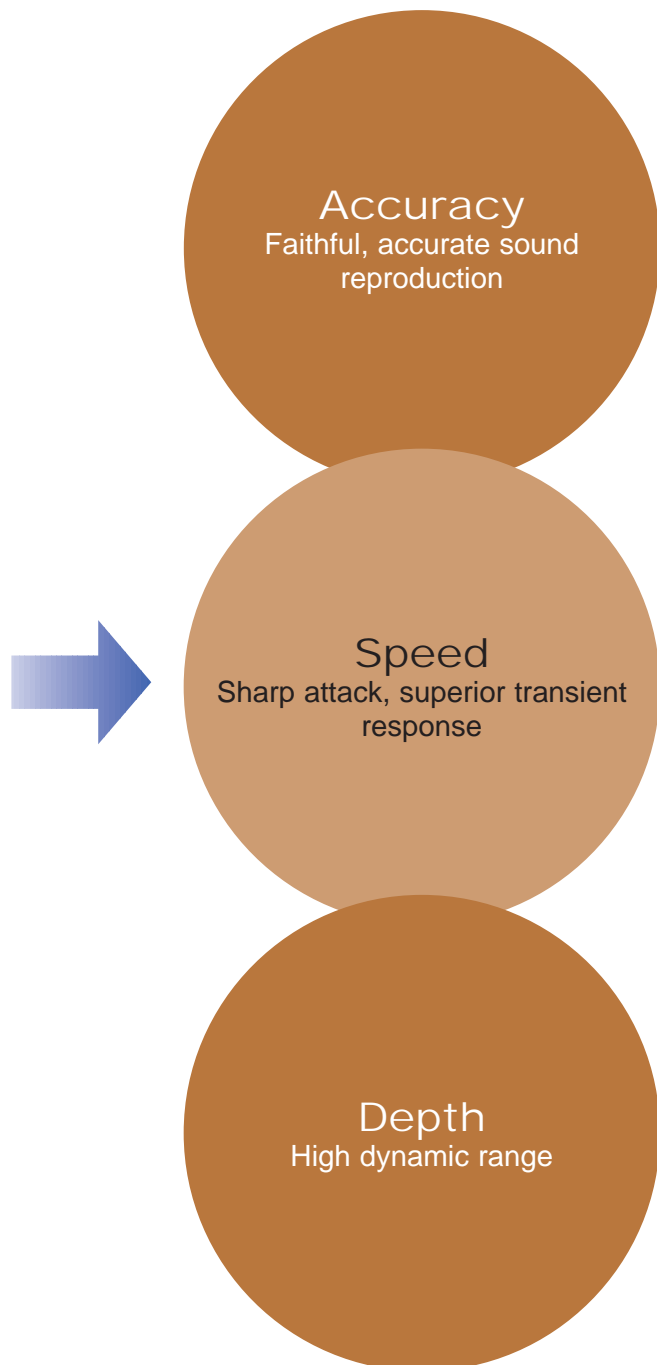
Many people know Yamaha as one of the world's top manufacturers of home and professional audio equipment, musical instruments, and motorcycles. But what they don't know is that we're also a leader in acoustic research and technology, and in the development and production of sophisticated audio microprocessors. We were also one of the first companies to embrace digital technology, and have done much to make digital audio as popular as it is today.

All of which means that we are ideally qualified to produce the world's finest home theater systems. With years of acoustic, audio, and digital expertise to draw on, we have been able to develop innovative, high-performance home theater systems that make it possible to enjoy movies at home with all the dramatic sound impact that the director intended to convey.

Now, in response to growing demand for a home theater reference speaker system worthy of the Yamaha name, we have developed the HX Series Home Theater Reference Speaker System – the ultimate choice for home theater enjoyment in the digital age.

## **The 3 Elements of Ideal Home Theater Sound**

For Accurately Reproducing the  
Intentions of Those Who Create  
Movie Soundtracks



## HX Series: Home Theater Reference Speaker Systems

Yamaha's goal in developing the HX Series speakers was to achieve the three key elements of accuracy, speed and depth, thereby creating a home theater audio experience comparable to a real movie theater or concert hall. This goal has been brilliantly realized on the HX Series, assuring superb reproduction that expresses every nuance of the soundtrack designer or concert-recording engineer's intentions.

### The Waveguide Horns

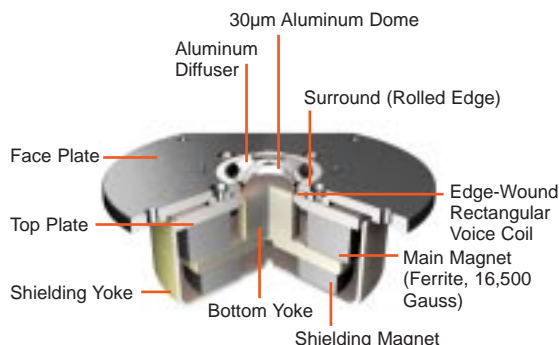
When conventional direct radiating speakers are used in a home environment, their broad directional characteristics result in a relatively high proportion of reflected sound. Even at frequencies above 5kHz, a significant portion of the sound reaching the listeners' ears has been reflected from the room's walls.

Modern movie theaters, however, are designed to offer a highly absorptive acoustic environment in which soundtrack recordings with five or more channels can be used to achieve a rich sense of spatial expression. To achieve a similar level of spatial expression in the home, it is therefore necessary to use speakers with a direct/reflected sound ratio that is quite different from the speakers used for listening to conventional music recordings.

Yamaha's exclusive Waveguide Horns were specifically developed to address this problem, and have now been refined and improved to offer an even higher level of spatial expression in home



#### NS-8HX Tweeter Construction



listening environments.

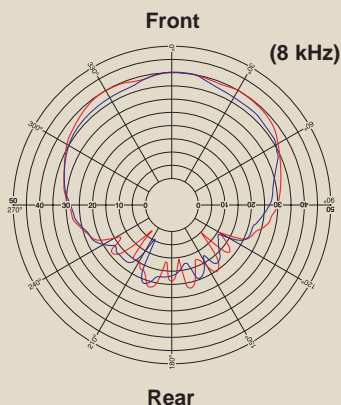
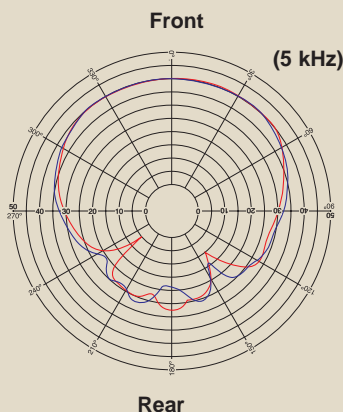
#### Optimal Direct/Reflected Wave Energy Ratio for Home Theater Sound

Yamaha's exclusive Waveguide Horns differ from conventional horns in that their waveguide features a horizontal control angle of 135° and a vertical control angle of 120°. This allows the sound field to be shaped and controlled for optimal spatial expression in home theater environments.

#### Diecast Aluminum Waveguides

Yamaha tested a wide range of waveguide materials to determine which offered the best home theater sound reproduction quality. Cherry and other hardwoods were considered, but in the end, diecast aluminum was found to make the detailed nuances of dialogue easier to hear, while providing the incisive attack needed for action and horror scenes.

#### Flat High-Frequency Directional Characteristics of the Waveguide Horn (NS-8HX)



— Conventional Radiation  
— Waveguide Horn Radiation

High frequency directional characteristics of an installed Waveguide Horn speaker (red lines) and ordinary (blue lines). The Waveguide Horn speaker shows excellent balance in the front direction, with the surround effect to the sides and rear is not adversely affected by reflected sounds.

# FACTS, FEATURES & BENEFITS

## Light, Stiff, White Spruce Diaphragms for Midrange & Woofer Drivers

Yamaha's White Spruce Diaphragm (WSD) material emerged from an intensive search for a light, tough diaphragm material that would help us achieve the three elements of ideal home theater sound.

The pulp material used for the WSD is manufactured almost entirely from long fibers of Canadian evergreen white spruce, the world's lightest single-sheet diaphragm material. With a Young's coefficient\* equal to that of metal, WSD material offers both exceptional toughness and lightness.

An exclusive Yamaha process accounts for the distinctive white color of WSD material. It was selected for use on the HX Series to reflect the performance heritage of the Yamaha NS-10M, a long-selling model that has been popular as a studio monitor for over 20 years.

\* The ratio of stretching force per unit of cross-sectional area to elongation per unit of length.

## Edge-Wound Rectangular Voice Coils with Aluminum Diecast Frames

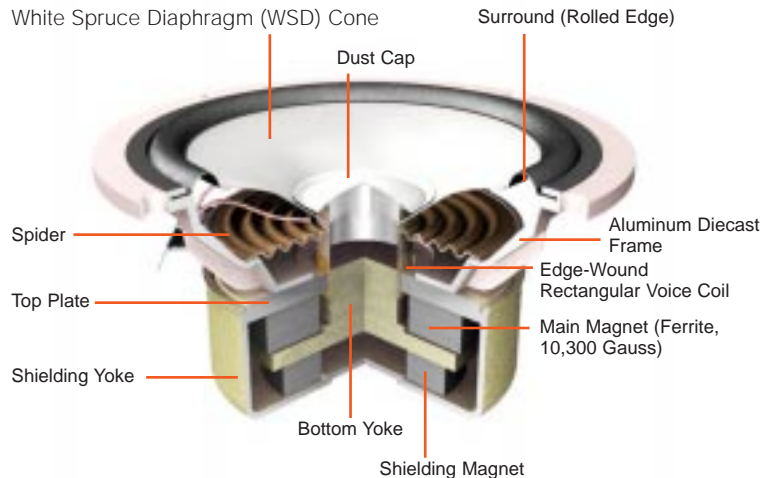
These two high-quality components are now used in only a few luxury units. The edge-wound rectangular voice coils have a wire moment 20% higher than

conventional round voice coils, significantly improving the efficiency with which they convert magnetic flux to motion. In addition, aluminum diecast frames with flexural strength three to five times higher than that of normal metal plate or plastic frames further enhance performance..

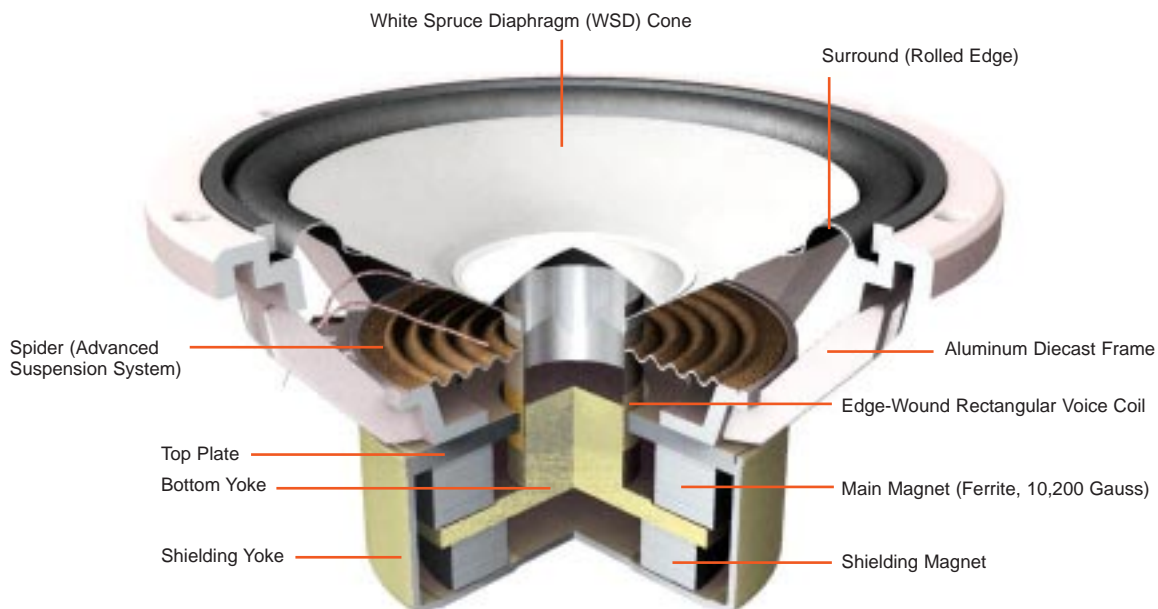
## Advanced Suspension System and Spider

An advanced suspension system and spider are used in the HX Series to guarantee dynamic linearity and reduce unwanted vibration.

### NS-8HX White Spruce Diaphragm (WSD) Midrange Driver Construction



### NS-8HX White Spruce Diaphragm (WSD) Woofer Construction



## HX Series: Home Theater Reference Speaker Systems

### All-Aluminum Dome Tweeters and Diffusers

Both the shape and material used for dome tweeter diaphragms and diffusers were refined to improve speed and response. 30 $\mu$ m pure aluminum film was formed into a new dome shape and fitted with an all-aluminum diffuser for wide-ranging 50kHz sound reproduction capability.

### Magnetic Shielding

As befits their status as a top-of-the-line home theater reference speaker systems, the HX Series is equipped with magnetically shielded cases that prevent interference with video components and signals.

## Independent Direct Crossover Networks

### Fully Independent Driver Elements

Crosstalk distortion that can result from signal interference between coils, cables and drivers is kept to an absolute minimum by using fully independent direct crossover connections for low-, medium- and high-range driver elements. In addition, interference between speakers of the same diameter and range is reduced by using independent elements for each driver in center speaker and double woofer systems.

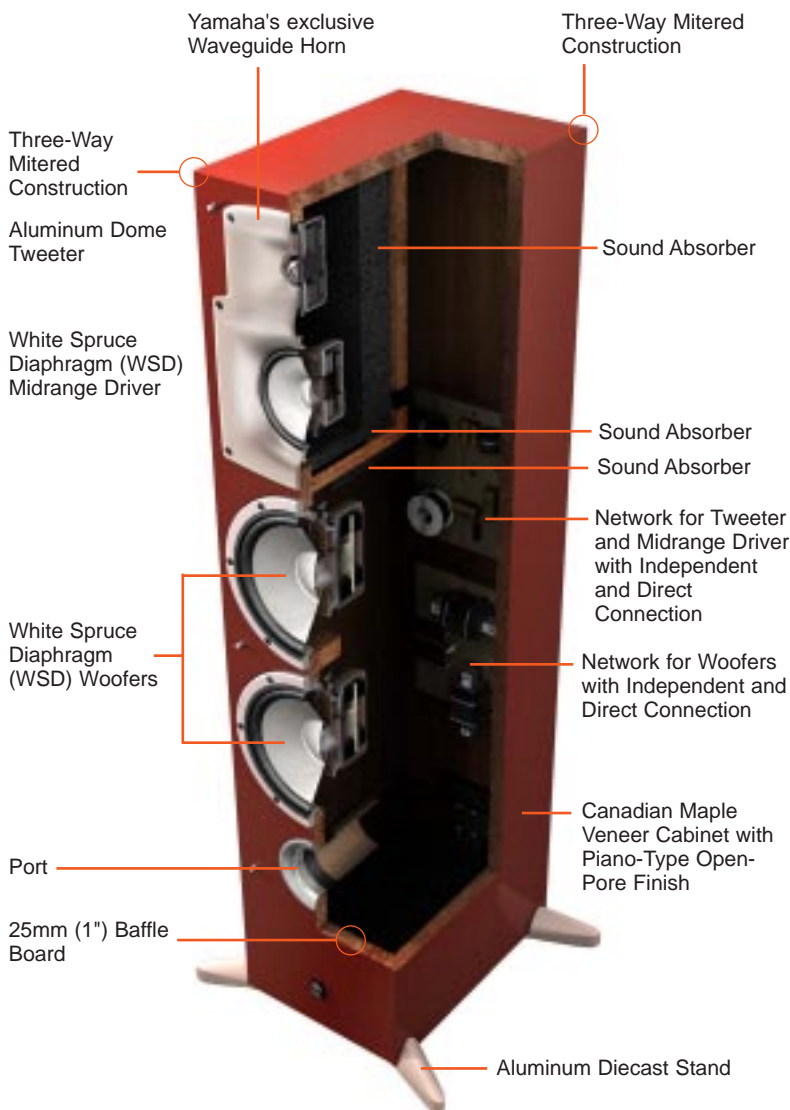
### Direct Connections

The HX Series uses short lead wires and direct terminal connections for each component to minimize energy loss and reduce interference. This is in contrast to most other manufacturers, who use low-cost printed circuit boards that can degrade reproduction quality.

### High-Quality Capacitors and Coils

The HX Series uses metallized polypropylene capacitors generally found only in top-of-the-line components and studio systems. This lowers the tan-

NS-8HX Interior View



$\delta$  (delta) value that represents internal energy loss (dielectric loss), thereby enhancing accuracy, speed and depth. Magnetic linearity has also been improved; in the low range by using a large inductor with a rod-shaped silicon steel core, and in the high range by using an air-core inductor.

### Heavy-Gauge Internal Wiring

Heavy-gauge, 0.014ohm/m cables are used for all internal wiring to keep energy loss to an absolute minimum.



# FACTS, FEATURES & BENEFITS

## Natural Wood Cabinets

### Three-Way Mitered Construction

Yamaha speakers have featured 45° mitered-joint construction at the cabinet corners and baffle/body joints for many years. On the HX Series, mitered construction is also used for the back panel, improving the tightness of the joints so that the entire cabinet behaves as a single rigid body. This reduces unwanted vibration and helps realize the three key elements of ideal home theater sound.



### 25mm (1") Baffle Board

Exceptionally thick, 25mm (1") baffle board is used in HX Series speakers\* to further reduce unwanted vibration.

\* Except NS-2HX speakers, which feature 15mm (5/8") baffle boards.

### Canadian Maple Veneer Cabinets with Piano-Type Open-Pore Finish

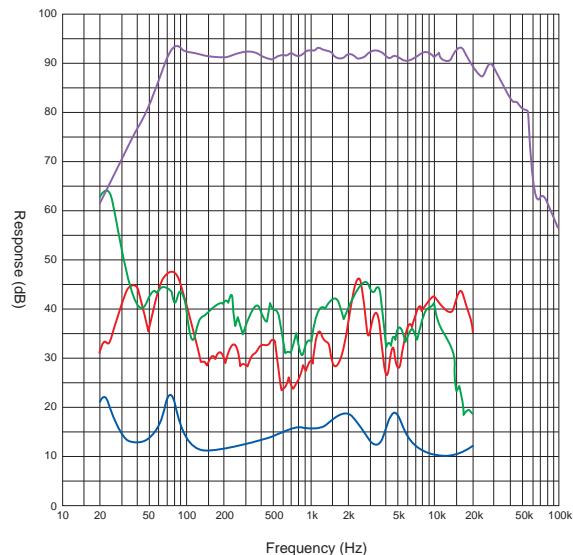
Canadian maple hardwood cabinets are given the same luxurious and environmentally friendly (non-PVC) finish used on Yamaha's finest wood-grain pianos.

### Bi-Wiring Connectivity

Signal integrity is enhanced by a bi-wiring system that provides separate +/- connection terminals for the woofer(s) and tweeter/other driver(s).



### NS-8HX Frequency Response, Harmonic Distortion and Impedance Characteristics



The result is decreased modulation distortion for purer sound quality.

### Aluminum Diecast Stands

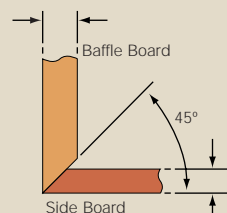
NS-8HX and NS-6HX tower speakers are equipped with heavy-duty aluminum diecast stands that provide solid floor contact for accurate sound reproduction. The stands also feature a high-quality finish that nicely complements the speakers' elegant design.



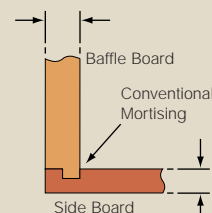
## Yamaha's Exclusive Three-Way Mitered Construction Produces Strong, Sturdy Cabinets with Minimum Resonance.

Yamaha's exclusive three-way mitered construction significantly improves the durability and precision of panel joints in HX Series cabinets. The cabinets resist deformation over time, and their precise construction suppresses unwanted resonance when speakers are played at high volume. Three-way mitering requires advanced production technology and rigorous quality control \_ particularly when manufacturing compact cabinets \_ and these are areas in which Yamaha has extensive expertise. In addition, our long experience as a monitor speaker manufacturer assures a high standard of woodworking excellence.

### Three-Way Mitered Construction



### Conventional Mortised Construction



## HX Series: Home Theater Reference Speaker Systems



	<b>NS-8HX</b>	<b>NS-6HX</b>	<b>NS-4HX</b>
Type	3-way bass-reflex	3-way bass-reflex	2-way bass-reflex
Woofer	Dual 20cm (8") WSD cone	20cm (8") WSD cone	Dual 13cm (5") WSD cone
Midrange Driver	13cm (5") WSD cone	13cm (5") WSD cone	
Tweeter	3cm (1 <sup>1</sup> / <sub>8</sub> ") Aluminum dome	3cm (1 <sup>1</sup> / <sub>8</sub> ") Aluminum dome	3cm (1 <sup>1</sup> / <sub>8</sub> ") Aluminum dome
Magnetic Shielding	Yes	Yes	Yes
Input Power (Max/Nominal)	400 W/140 W	300 W/100 W	300 W/100 W
Sensitivity	92 dB/2.83 V/m	91 dB/2.83 V/m	91 dB/2.83 V/m
Frequency Response	35–50,000 Hz	45–50,000 Hz	55–50,000 Hz
Impedance	6 ohms	6 ohms	6 ohms
Dimensions (W x H x D)	364 x 1,102 x 397 mm 14 <sup>5</sup> / <sub>16</sub> " x 43 <sup>3</sup> / <sub>8</sub> " x 15 <sup>5</sup> / <sub>8</sub> "	364 x 1,062 x 397 mm 14 <sup>5</sup> / <sub>16</sub> " x 41 <sup>13</sup> / <sub>16</sub> " x 15 <sup>5</sup> / <sub>8</sub> "	186 x 500 x 257 mm 7 <sup>5</sup> / <sub>16</sub> " x 19 <sup>11</sup> / <sub>16</sub> " x 10 <sup>1</sup> / <sub>8</sub> "
Weight	32.5 kg; 71.6 lbs.	30.5 kg; 67.3 lbs.	11.5 kg; 25.3 lbs.



	<b>NS-C7HX</b>	<b>NS-C5HX</b>	<b>NS-2HX</b>
Type	2-way acoustic suspension	2-way acoustic suspension	2-way bass-reflex
Woofer	Dual 16cm (6 <sup>1</sup> / <sub>4</sub> ") WSD cone	Dual 13cm (5") WSD cone	13cm (5") WSD cone
Tweeter	3cm (1 <sup>1</sup> / <sub>8</sub> ") Aluminum dome	3cm (1 <sup>1</sup> / <sub>8</sub> ") Aluminum dome	3cm (1 <sup>1</sup> / <sub>8</sub> ") Aluminum dome
Magnetic Shielding	Yes	Yes	Yes
Input Power (Max/Nominal)	300 W/100 W	300 W/100 W	200 W/60 W
Sensitivity	91 dB/2.83 V/m	91 dB/2.83 V/m	90 dB/2.83 V/m
Frequency Response	45–50,000 Hz	55–50,000 Hz	60–50,000 Hz
Impedance	6 ohms	6 ohms	6 ohms
Dimensions (W x H x D)	549 x 217 x 318 mm 21 <sup>5</sup> / <sub>8</sub> " x 8 <sup>9</sup> / <sub>16</sub> " x 12 <sup>1</sup> / <sub>2</sub> "	500 x 186 x 257 mm 19 <sup>11</sup> / <sub>16</sub> " x 7 <sup>5</sup> / <sub>16</sub> " x 10 <sup>1</sup> / <sub>8</sub> "	186 x 318 x 189 mm 7 <sup>5</sup> / <sub>16</sub> " x 12 <sup>1</sup> / <sub>4</sub> " x 7 <sup>7</sup> / <sub>16</sub> "
Weight	15 kg; 33.1 lbs.	11.5 kg; 25.3 lbs.	6 kg; 13.2 lbs.

# New Product Information

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HX Series Home Theater Reference Speaker Systems

Visit us at our website: <http://www.yamaha.co.jp/>

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